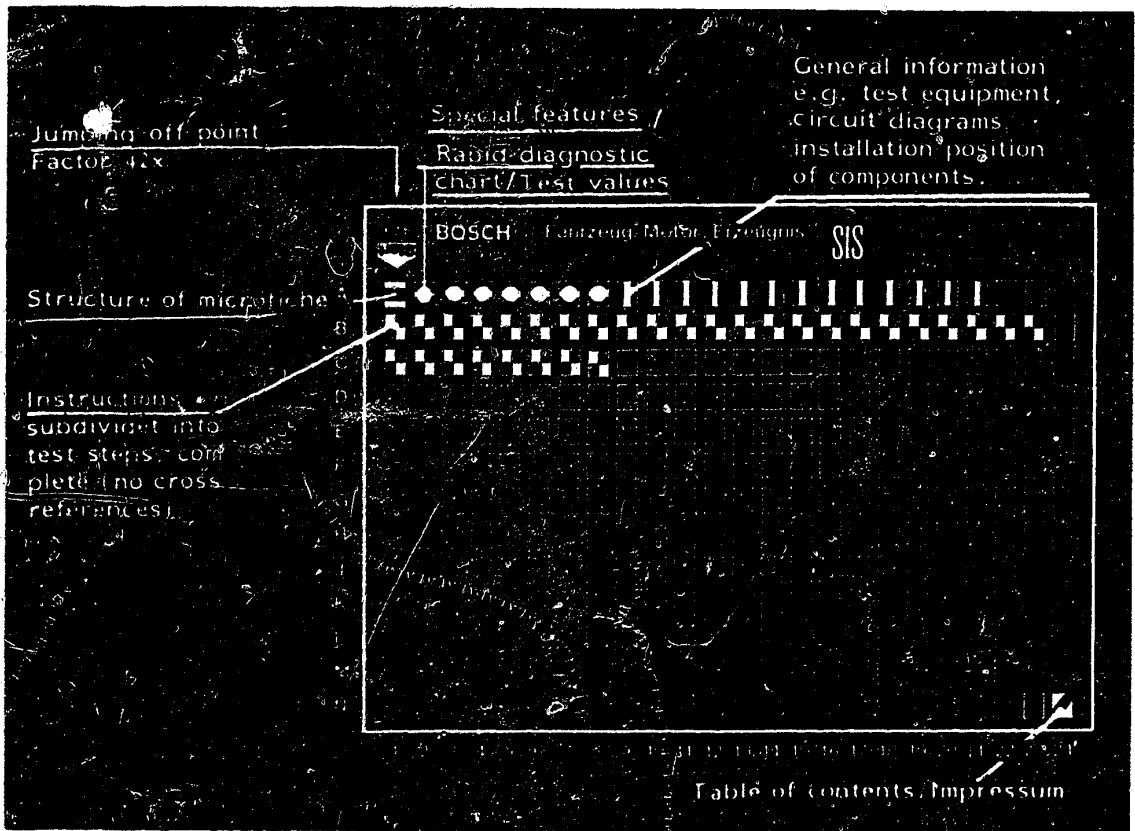


## Structure of microfiche



1. Read from left to right
2. Title of microfiche (appears on each coordinate)

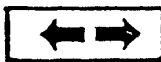
<b>E16</b>	Product/component/test step
	Vehicle/engine

Coordinate

3. Limits of section



Beginning



Mid-section



End



One-page section

4. References to relevant test steps in test specifications; coordinate e.g. C6

<b>C6</b>
-----------

**A1**

Trouble-shooting program



## 1. Special features

With these instructions it is possible to check all Mercedes-Benz passenger cars of type W 124 with standard-equipment automatic electronic heating system.

## 2. Rapid diagnosis chart for heating and air-conditioning test adapter

The following rapid diagnosis chart makes it possible for the experienced expert to quickly check the system with the test adapter KDHK 0001.

The contents of this chart are limited to the following:

- Sequence of test steps
- Switch position on adapter
- Test instructions and test specifications (readings on adapter)
- References to coordinates of the respective detailed testing and trouble-shooting program.

If detailed instructions and information are required, always proceed according to the trouble-shooting program starting on Coordinate B1.

### Test conditions

- Check customer complaints  
(Check operation of automatic heating system according to owner manual)
- Coolant level O.K.
- Engine running and at operating temperature
- Electrical system (fuses, battery voltage) O.K.
- Blower switch at position IIII or fan operating at max. speed
- Air-distributor switch on vehicle at footwell position

The ignition must be off when disconnecting plug connectors.



Rapid diagnosis chart for automatic electronic heating system (Duo-Heizmatik)  
 Test adapter KDHK 0001 with adapter lead KDHK 0009

Test step	Rotary switch position	Testing of	Test instructions	Reading/ test specification	Coordinate
1	1	Control unit supply voltage		10...15	B 4
2	2	Passenger-compartment temperature sensor		5...11	B 6
2.1			Spray refrigerant spray into passenger-compartment temperature sensor	Falling while cooling	B 8
2.2			With blower running, check air admission to passenger-compartment temperature sensor (with paper strip)		B 10
3	7	Heating-water valve left-hand	Switch on auxiliary switch (S) on test adapter <u>No</u> heating effect on left - check by feeling	0...3	B 12
3.1			Switch off auxiliary switch (S) on test adapter <u>Heating</u> effect on left - check by feeling	9...14	B 14
4	8	Exchanger sensor left-hand	Test step to come directly after 3.1 (water in heat exchanger must be hot at start of test).	7...12 slowly falling	B 16

**A3**

Rapid diagnosis chart  
 Mercedes-Benz W 124



**A4**

Rapid diagnosis chart  
 Mercedes-Benz W 124



Rapid diagnosis chart for automatic electronic heating system (Duo-Heizmatik)  
 Test adapter KDHK 0001 with adapter lead KDHK 0009  
 (continued)

Test step	Rotary switch position	Testing of	Test instructions	Reading/ test specification	Coordinate
5	9	Heating-water valve right-hand	Switch on auxiliary switch (S) on test adapter <u>No</u> heating effect on right - check by feeling	0...3	B 18
5.1			Switch off auxiliary switch (S) on test adapter Heating effect on right - check by feeling	9...14	B 20
6	10	Exchanger sensor right-hand	Test step must come directly after 5.1 (water in heat exchanger must be hot at start of test).	7...12 slowly falling	B 22
7	11	Heating-water pump	(Heating-water pump is not installed in types 200 and 230E with manual transmission) Return blower switch to position I. Switch off engine. Switch on ignition. Switch on auxiliary switch (S) on test adapter. <u>Heating-water pump operating</u> - check by feeling/listening.	0...3	C 1
7.1			Switch off auxiliary switch (S) on test adapter. <u>Heating-water pump not operating</u> - check by feeling/listening.	9...14	C 3

**A5**

Rapid diagnosis chart  
 Mercedes-Benz W 124



**A6**

Rapid diagnosis chart  
 Mercedes-Benz W 124



Test with heating, air-conditioning test adapter KDHK 0001 completed.

Set rotary switch (S1) on test adapter to "0"; switch off ignition; disconnect adapter lead KDHK 0009 from control-unit plug; connect control-unit plug to control unit; switch ignition on again.

As of year of manufacture E/87 the analog control unit was replaced by a digital control unit. This led to a change in the test specifications for the right-hand and left-hand temperature selectors.

Test step	Testing of	Test instructions	Reading/ test speci- fication	Coordinate
8	Temperature selec- tor thumbwheel left-hand	Using voltmeter, check directly at control unit term. 1 to term. 11 (ground) (control-unit plug connected to control unit). Left-hand temperature selector thumbwheel in "max" position (latched)	6,9...8,1V* 4,75...5,25V**	C 6
8.1		Left-hand temperature selector thumbwheel before "max" position	4,6...5,4V* 0,63...0,71V**	C 6
8.2		Left-hand temperature selector thumbwheel before "min" position	2,3...2,7V* 0,29...0,37V**	C 6
8.3		Left-hand temperature selector thumbwheel in "min" position (latched)	approx. 0 V	C 6
9	Temperature selector thumb- wheel right-hand	Using voltmeter, check directly at control unit term. 2 to term. 11 (ground) (control-unit plug connected to control unit). Right-hand temperature selector thumbwheel in "max" position (latched)	6,9...8,1V* 4,75...5,25V**	C 7
9.1		Right-hand temperature selector thumbwheel before "max" position	2,6...5,4V* 0,63...0,71V**	C 7
9.2		Right-hand temperature selector thumbwheel before "min" position	2,3...2,7V* 0,29...0,37V**	C 7
9.3		Right-hand temperature selector thumbwheel in "min" position (latched)	approx. 0 V	C 7

\* Analog control unit

\*\* Digital control unit

**A7**

Rapid diagnosis chart

Mercedes-Benz W 124



**A8**

Rapid diagnosis chart

Mercedes-Benz W 124



## 2. General introduction

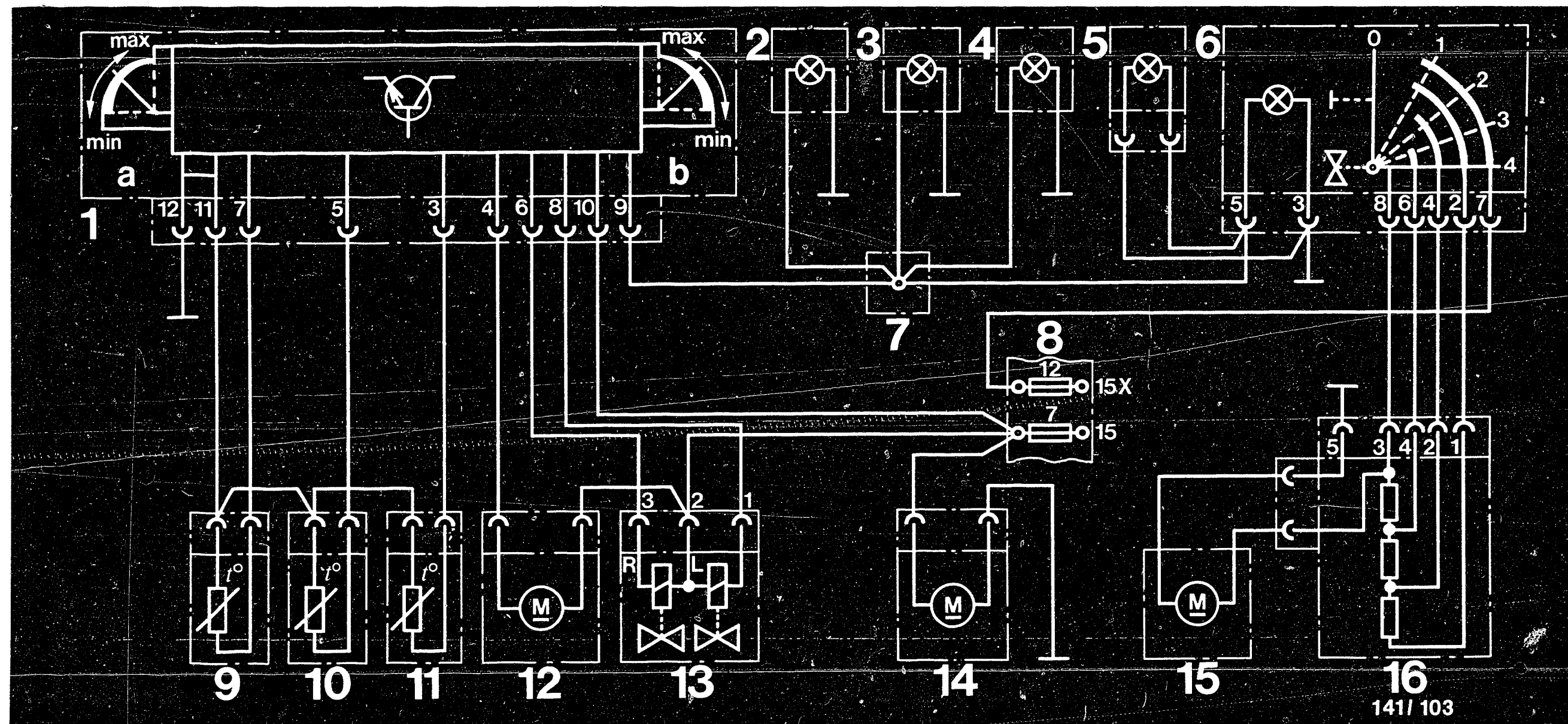
### Automatic heating system

The passenger-compartment temperature is controlled by the electronic control unit by way of a resistance chain, consisting of two controllable resistors in the left-hand and right-hand temperature selector thumbwheels and by a passenger-compartment temperature sensor and two temperature sensors on the heat exchanger with temperature-sensitive resistors. The resistance is varied by the built-in potentiometer by turning a temperature selector thumbwheel. The passenger-compartment temperature sensor and the temperature sensors on the heat exchanger change their resistance in accordance with the ambient temperature. This total resistance is compared in the electronic control unit.

The passenger compartment is heated or cooled depending on the deviation. The passenger-compartment temperature sensor is connected by a hose to the air jet on the blower box or to a separate air blower (on vehicles with sliding roof). When the blower is running, air is drawn from the passenger compartment through the opening of the passenger-compartment temperature sensor. This admission of air guarantees a shorter response time of the passenger-compartment temperature sensor and thus high control accuracy. The duo heating-water valve regulates the coolant flow through the heat exchanger. It consists of two solenoid-operated valves which are energized by the electronic control unit.

The opening and closing times depend on the deviation of the actual temperature from the setpoint temperature. With the selector wheel latched in the "MIN" position, the passenger-compartment temperature is regulated to approx. 10°C. With the selector thumbwheel latched in the "MAX" position, the passenger-compartment temperature is regulated to approx. 40°C.





- 1 = Automatic heating system control and operating unit
- a = Left-hand temperature selector thumbwheel
- b = Right-hand temperature selector thumbwheel
- 2 = Air nozzle illumination, center
- 3 = Air nozzle illumination, left
- 4 = Air nozzle illumination, right
- 5 = Air-distributor switch illumination

- 6 = Air-flow switch
- Main ground (behind instrument cluster)
- Ground, battery
- Ground, center console
- 7 = Cable connector, terminal 58d
- 8 = Fuse and relay box
- 9 = Heat-exchanger temperature sensor, left
- 10 = Heat-exchanger temperature sensor, right

- 11 = Passenger-compartment temperature sensor
- 12 = Recirculation pump (except on models 200 and 230E with manual transmission)
- 13 = Duo valve
- 14 = Passenger-compartment temperature-sensor air blower (only on vehicles with sliding roof)
- 15 = Blower motor
- 16 = Blower-motor series-resistor group

**A10**

Basic circuit diagram  
Mercedes-Benz W 124



**A11**

Basic circuit diagram  
Mercedes-Benz W 124



#### 4. Test equipment and tools

Heating and air conditioning  
test adapter

KDHK 0001

Automatic heating system adapter lead

KDHK 0009

Multimeter ETE 014.00  
or e.g. Pontavi

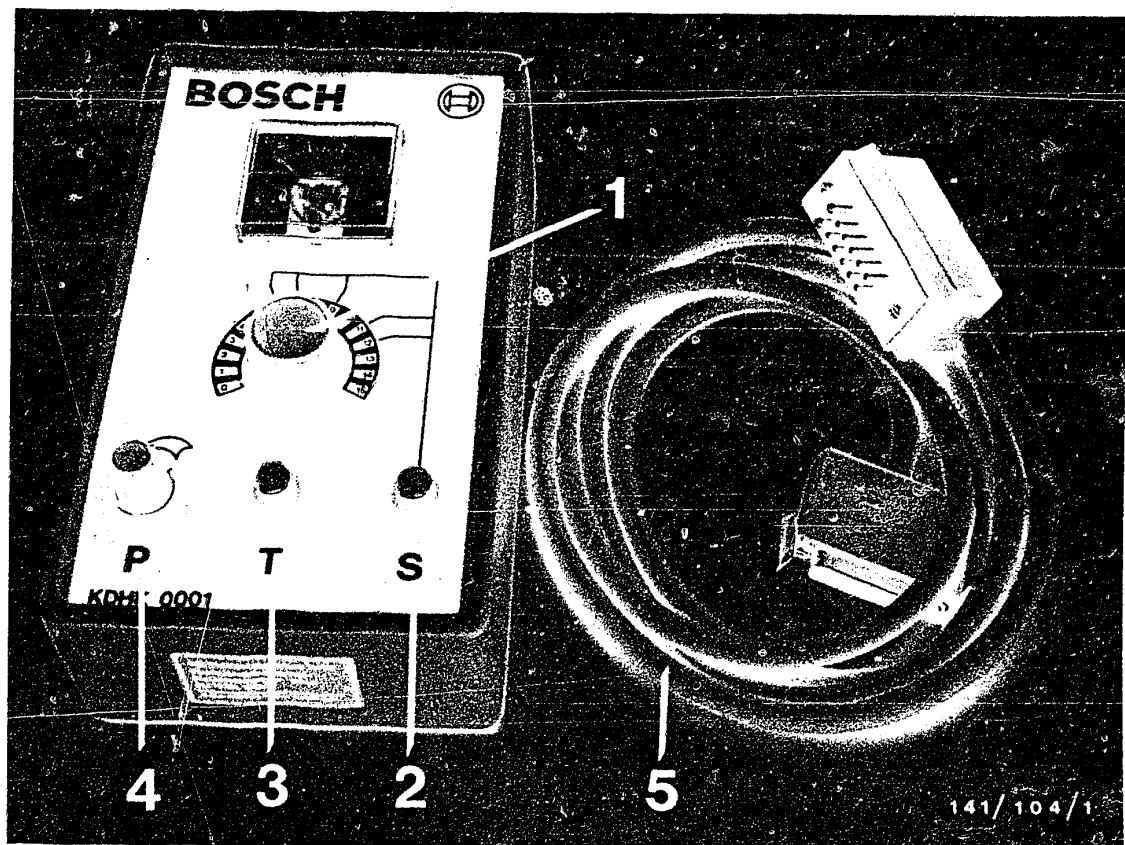
0 684 101 400  
Commercially  
available

Refrigerant spray

Commercially  
available







#### 4.1 Heating and air conditioning test adapter (KDHK 0001)

- 1 = Rotary switch (S1)
- 2 = Auxiliary switch (S)
- 3 = Nonlocking switch (T)
- 4 = Potentiometer (P)
- 5 = Adapter lead for automatic heating system (KDHK 0009)



## Explanatory notes on heating and air conditioning test adapter KDHK 0001

The heating and air conditioning test adapter is used for testing the peripherals on heating control and air conditioning systems. The electronic control units are not tested with the adapter.

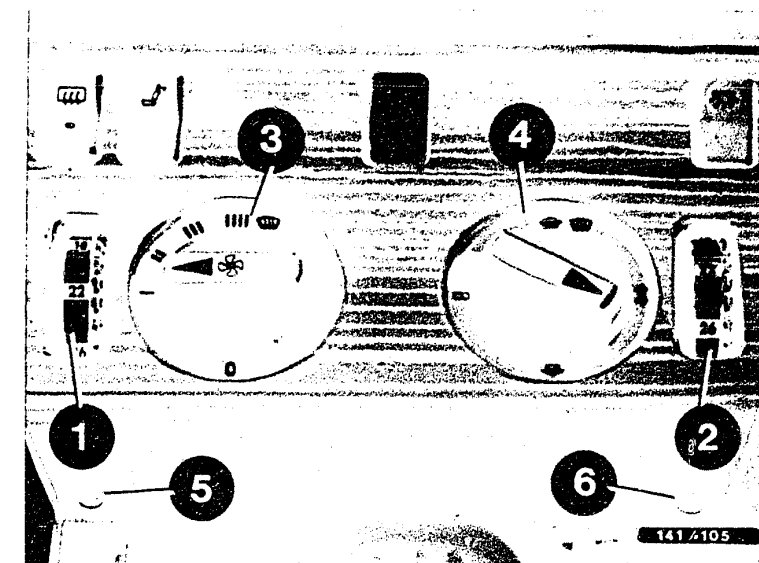
### Design

The test adapter is designed so that, with the rotary switch (S1), the individual components as well as the electric leads are switched on and measured one after the other.

With the auxiliary switch (S) it is possible to check a certain group of components for 2 different functions.

Nonlocking switch (T) and potentiometer (P) without function for MB automatic heating system (Duo-Heizmatik).

Use adapter lead KDHK 0009 for checking the system.



### Controls of automatic heating system

- 1 = Left-hand temperature selector thumbwheel
- 2 = Right-hand temperature selector thumbwheel
- 3 = Blower switch
- 4 = Air-distributor switch
- 5,6 = Fastening screws of wooden panel

**A14**

Heating and A/C test adapter  
Mercedes-Benz W 124



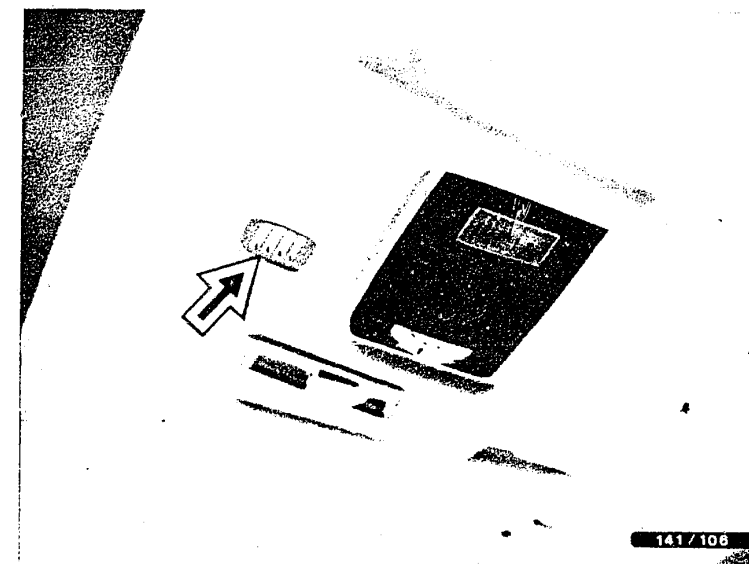
**A15**

Heating and A/C test adapter  
Mercedes-Benz W 124



## 5. Installation position of components

The passenger-compartment temperature sensor is in the roof next to the interior lamp (see picture, arrow). Removal and installation through the opening of the interior lamp.



141 / 108

**A16**

Installation position of components

Mercedes-Benz W 124



**A17**

Installation position of components

Mercedes-Benz W 124



The duo heating-water valve is in the so-called equipment space on the right-hand side (as viewed in the forward direction of travel) in front of the battery (see top picture).

Heating-water pump (not installed in 200 and 230E with manual transmission) is in the engine compartment on the right-hand side as viewed in the forward direction of travel (see bottom picture).

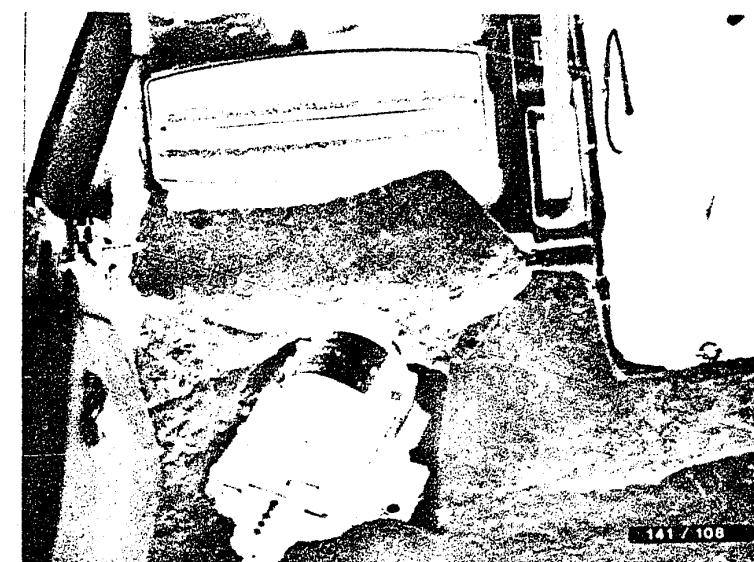
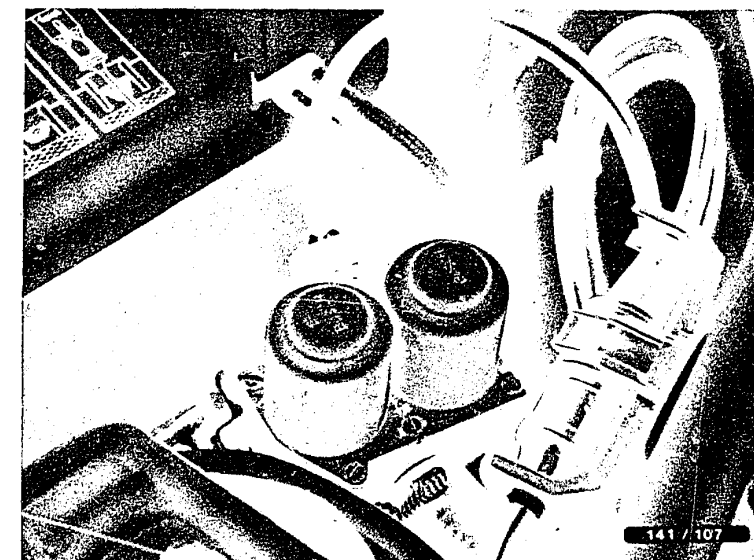
Electronic control unit (temperature controller)

The electronic control unit is installed in the control panel in the center console.

Note:

As of mid-85, a change has been made to a new non-interchangeable control-unit housing. Control unit is identical in operation.

The additional blower for air admission to the passenger-compartment temperature sensor is installed under the glove compartment insert (center picture).



**A18**

Installation position of components

Mercedes-Benz W 124



**A19**

Installation position of components

Mercedes-Benz W 124

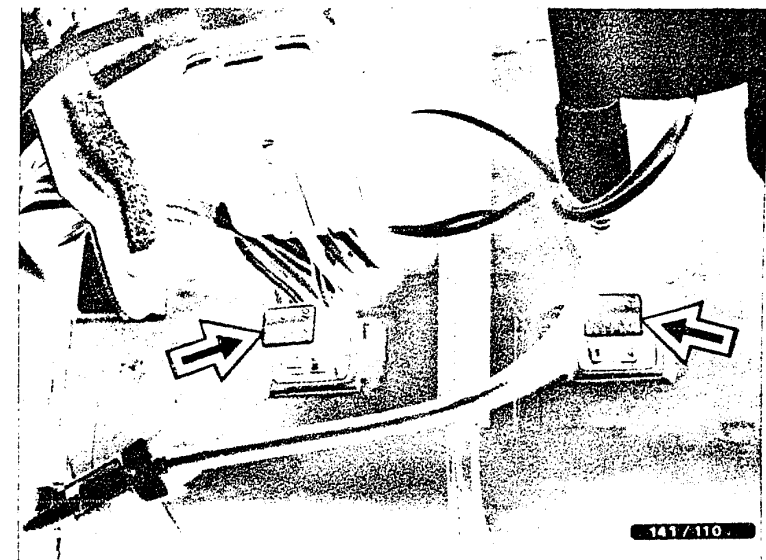


### Heat exchangers left/right

Both heat exchangers for the left-hand and right-hand heat exchanger sides are in the heater housing (see picture, arrows).

#### Note:

Exchanger sensors are accessible only after removing the center-console cover (ashtray, switch and radio must be removed).



**A20**

Installation position of components

Mercedes-Benz W 124



**A21**

Installation position of components

Mercedes-Benz W 124



## 6. Trouble-shooting according to test steps

### 6.1 Preconditions

- Check customer complaints  
(Check operation of automatic heating system according to vehicle owner manual)
- Coolant level O.K.
- Engine running and at normal operating temperature
- Electrical system (fuses, battery voltage) O.K.
- Blower switch at position IIII or blower running at max. speed
- Air-distributor switch on vehicle to footwell position

In the detailed trouble-shooting starting on Coordinate B 2, go through the test test steps one after the other.

Only if an incorrect reading is obtained proceed with the trouble-shooting in the right-hand column.



## 6.2 Connecting the adapter lead

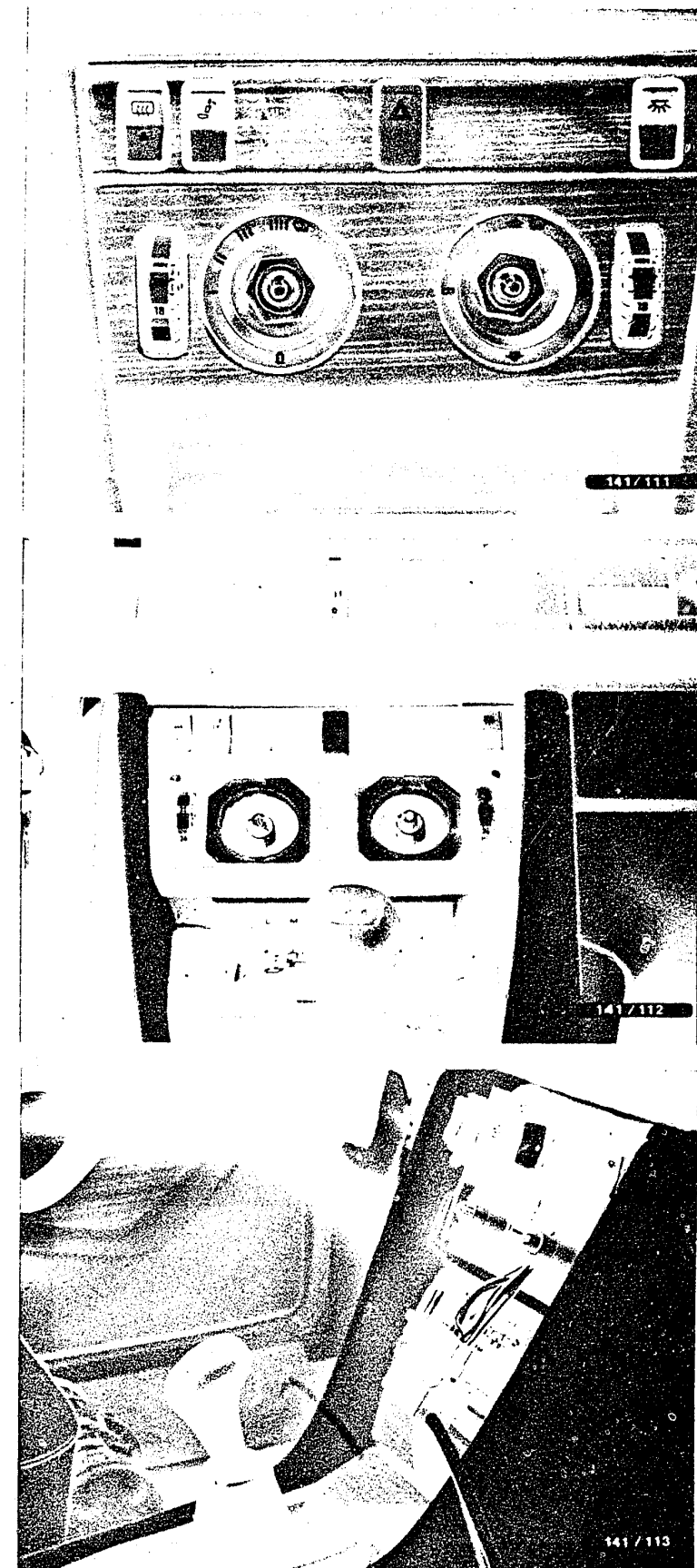
To connect the adapter lead, it is necessary to remove the control panel with electronic control unit installed.

To do this, remove control knobs from air-distribution switch and blower switch (see top picture).

Unscrew wooden-panelling fastening screws. Remove panelling. Unscrew screw connectors of air-flow and blower switches (see center picture). Unscrew fastening screws of control panel with control unit installed. Remove control panel.

### Note:

Perform the trouble-shooting with the aid of the test chart. If the connection between control-unit plug and adapter lead or adapter lead and test adapter is to be disconnected, always beforehand set the rotary switch on the test adapter to "0" and switch off the ignition.

**B2**

Trouble-shooting

Mercedes-Benz W 124

**B3**

Trouble-shooting

Mercedes-Benz W 124



Test step 1

Operation  
Rotary switch position  
(S1): 1

Measuring equipment  
Test adapter

Measuring range:  
0 ... 15

Operation in vehicle:  
Engine running

Reading on test adapter  
10 ... 15

Testing of:  
Electronic control unit power  
supply

Test specification obtained?

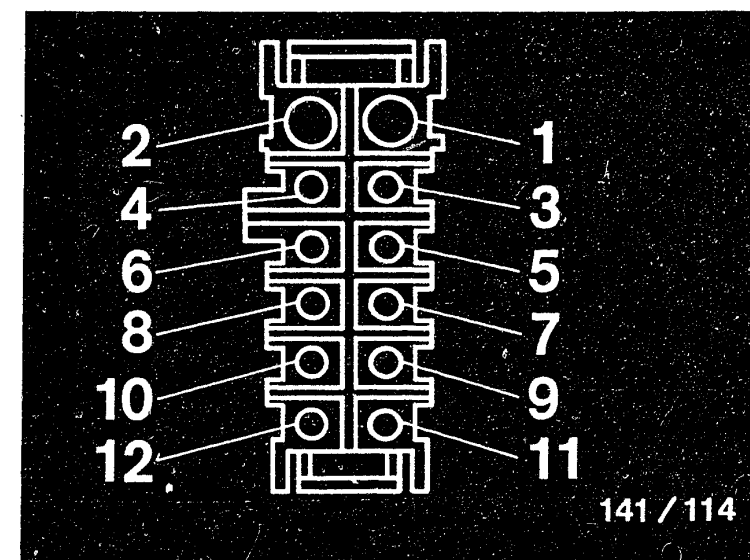
no

Trouble-shooting with multimeter:

Using voltmeter, check from control-unit plug  
socket 12 to + term. 30 and from socket 10 to  
ground.

Reading should be approx.  $V_B$

Eliminate contact resistances at plug-in  
connections.  
If reading  $> V_B$ , alternator regulator is defec-  
tive.



yes

Continued on B6/B7

**B4**

Trouble-shooting  
Mercedes-Benz W 124



**B5**

Trouble-shooting  
Mercedes-Benz W 124





Test step 2

Operation

Rotary switch position (S1): 2

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation in vehicle:

Engine running

Reading on test adapter

5 ... 11  
(dependent on passenger-compartment temperature)

Testing of:

Resistance of passenger-compartment temperature sensor

Test specification obtained?

no

### Trouble-shooting with multimeter

Switch off ignition.

Using ohmmeter, check the following leads for continuity and short circuit:

- from control-unit plug socket 3 to plug of passenger-compartment sensor
- from control-unit plug socket 11 to plug of passenger-compartment temperature sensor

Reading approx.  $0 \Omega$

on control-unit plug socket 3 to socket 11

Reading approx.  $\infty \Omega$

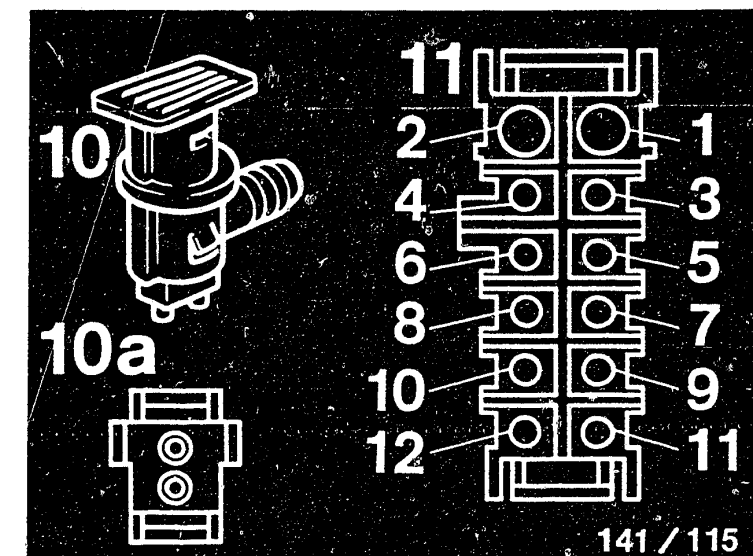
(Passenger-compartment temperature sensor plug disconnected).

If applicable, eliminate any contact resistances and open circuits on leads.

Check resistance of passenger-compartment temperature sensor directly at pins of passenger-compartment temperature sensor.

Reading should be approx.  $8...16 \text{ k}\Omega$  at approx.  $+15^\circ...+30^\circ\text{C}$  at temperature sensor

If reading not within tolerance, replace temperature sensor.



10 = Passenger-compartment temperature sensor

10a = Plug of passenger-compartment temperature sensor

11 = Control-unit plug

Continued on B8/B9

**B6**

Trouble-shooting

Mercedes-Benz W 124



**B7**

Trouble-shooting

Mercedes-Benz W 124



Test step 2.1

Operation:

Rotary switch position (S1): 2

Measuring equipment:

Test adapter

Measuring range:

0 ... 15

Operation in vehicle:

Engine running

Additional operation:

Spray refrigerant spray into sensor

Reading on test adapter:

Falling during cooling

Testing of:

Resistance of passenger-compartment temperature sensor

Does reading fall during cooling?

Trouble-shooting with multimeter:

Switch off ignition.

Check resistance of passenger-compartment temperature sensor directly at pins of passenger-compartment temperature sensor.

Reading should be approx. 8...16 k $\Omega$  at approx. +15°...+30°C at temperature sensor.

Spray passenger-compartment temperature sensor with refrigerant spray.

Resistance must increase. If so, passenger-compartment temperature sensor O.K.

Using ohmmeter, check the following leads for continuity and short circuit.

- from control-unit plug socket 3 to plug of passenger-compartment temperature sensor
- from control-unit plug socket 11 to plug of passenger-compartment temperature sensor

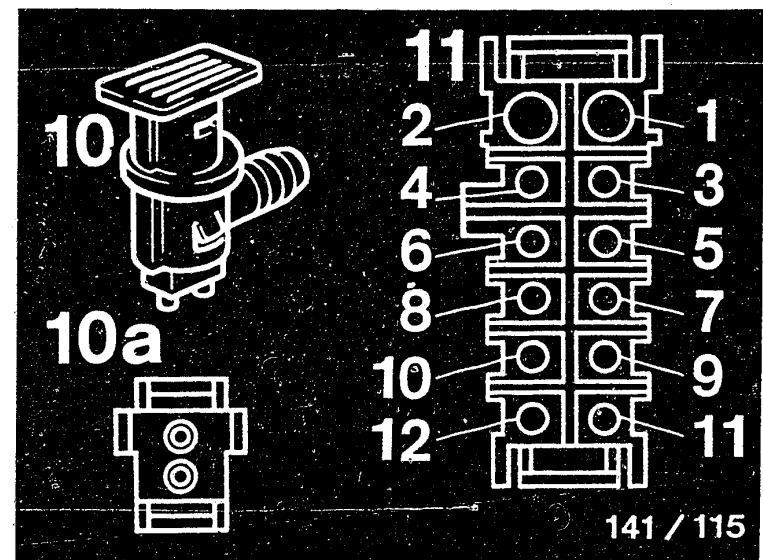
Reading approx. 0  $\Omega$

on control-unit plug socket 3 to socket 11

Reading approx.  $\infty$   $\Omega$

(Plug of passenger-compartment temperature sensor disconnected).

If applicable, eliminate any contact resistances/open circuits on the leads.



10 = Passenger-compartment temperature sensor

10a = Plug of passenger-compartment temperature sensor

11 = Control-unit plug

yes

Continued on B10/B11

## Test step 2.2

### Operation:

Rotary switch position  
(S1): 2

### Measuring equipment:

Paper strip or similar

### Operation in vehicle:

Engine running  
Blower switch at position IIII

### Additional operation:

Hold paper strip in front of  
passenger-compartment sensor  
air-admission opening.

### Reading:

Paper strip pulled onto air-  
admission opening

### Testing of:

Drawing-in of air from passen-  
ger compartment through  
passenger-compartment sensor

Paper strip being pulled in?

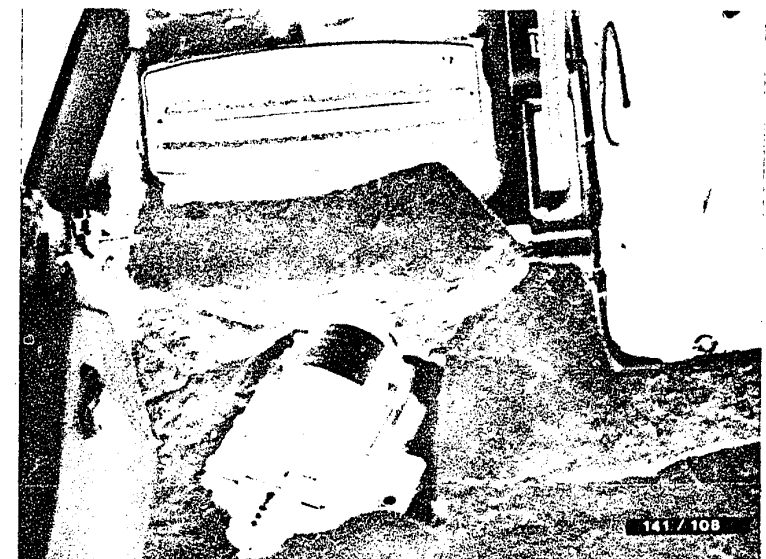
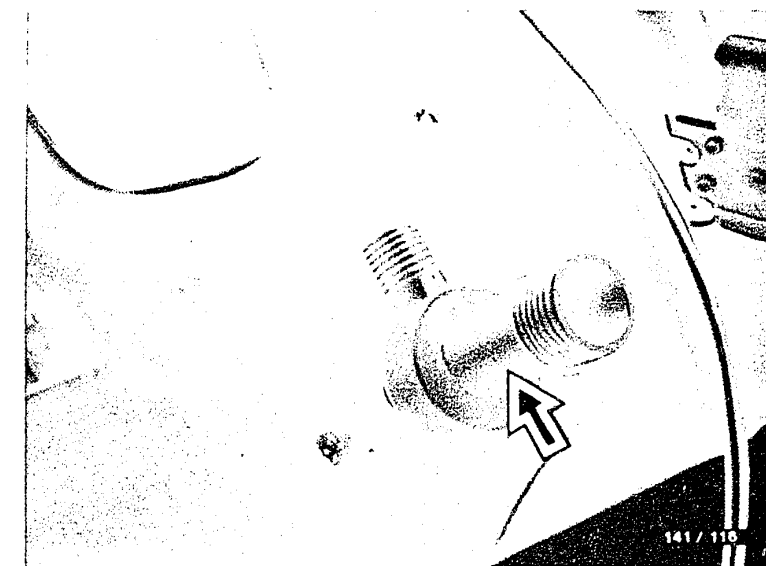
yes

Continued on B12/B13

### Trouble-shooting:

Check hose between passenger-compartment tempera-  
ture sensor housing and "air jet" on blower  
housing (see picture, arrow) for leaks and  
security.

no  
On vehicles with sliding roof:  
Check hose between passenger-compartment tem-  
perature sensor housing and air-admission blower  
for leaks and security.  
Using voltmeter, check at plug of air-admission  
blower socket 1 to socket 2. Reading should be  
approx.  $V_B$  (ignition on).



**B10**

Trouble-shooting

Mercedes-Benz W 124



**B11**

Trouble-shooting

Mercedes-Benz W 124



### Test step 3

#### Operation:

Rotary switch position  
(S1): 7

#### Measuring equipment:

Test adapter

#### Measuring range:

0 ... 15

#### Operation in vehicle:

Engine running

#### Additional operation:

Press auxiliary switch "S" on  
test adapter.

#### Reading on test adapter:

0 ... 3

By feeling, check that there  
is no heating effect on the  
left.

#### Testing of:

Operation of heating-water  
valve left-hand

Reading obtained/no heating  
effect on left?

yes

Continued on B14/B15

#### Malfunction:

Heating effect present despite auxiliary switch  
"S" being pressed.

#### Trouble-shooting with multimeter:

Switch off ignition. Using ohmmeter, check lead  
from control-unit plug socket 8 to plug of duo  
heating-water valve socket 1.

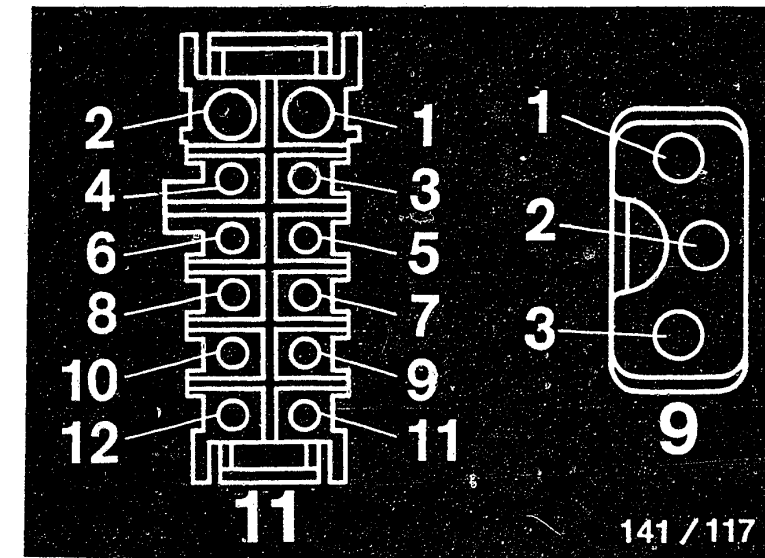
Reading approx.  $0 \Omega$

Using voltmeter, check at plug of duo heating-  
water valve socket 2 to ground.

Reading approx.  $V_B$

(Ignition on).

If leads are O.K. and if battery voltage present  
and heating effect present despite auxiliary  
switch "S" being pressed, heating-water valve  
defective - replace.



9 = Plug of duo heating-water  
valve  
11 = Control-unit plug

**B 12**

Trouble-shooting

Mercedes-Benz W 124



**B 13**

Trouble-shooting

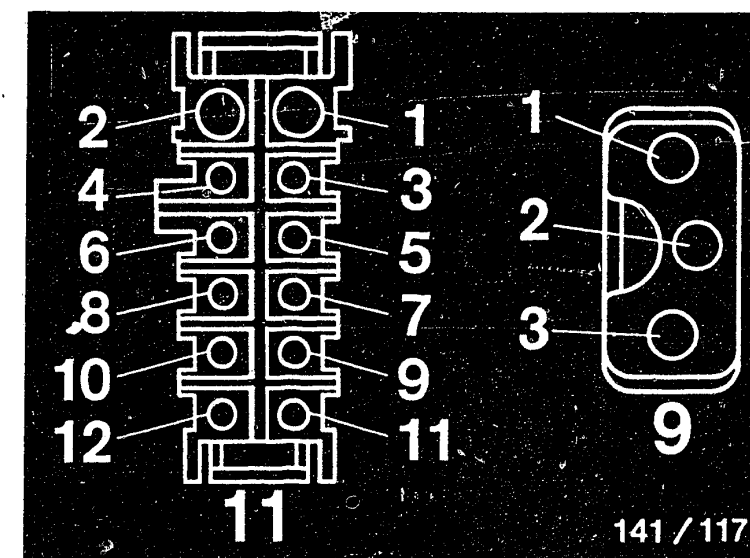
Mercedes-Benz W 124



Test step 3.1  
Operation:  
Rotary switch position  
(S1): 7  
Measuring equipment:  
Test adapter  
Measuring range:  
0 ... 15  
Operation in vehicle:  
Engine running  
Additional operation:  
Switch off auxiliary switch  
"S" on test adapter.  
Reading on test adapter:  
9 ... 14  
By feeling, check that there  
is a heating effect on the  
left.  
Testing of:  
Operation of heating-water  
valve left-hand.  
Test specification obtained/  
heating effect present?

no

Malfunction:  
No heating effect despite reading 9 ... 14.  
Heating-water valve electrically O.K. but mecha-  
nically defective - replace.  
Note: If system heats only at low engine speed,  
replace heating-water valve.



9 = Plug of duo heating-water valve  
11 = Control-unit plug

yes

Continued on B16/B17

**B14**

Trouble-shooting  
Mercedes-Benz W 124



**B15**

Trouble-shooting  
Mercedes-Benz W 124



**Test step 4**  
 (must come immediately after test step 3.1)

**Operation:**  
 Rotary switch position (S1): 8

**Measuring equipment:**  
 Test adapter

**Measuring range:**  
 0 ... 15

**Operation in vehicle:**  
 Engine running

**Reading on test adapter:**  
 7 ... 12

slowly falling

**Testing of:**  
 Temperature sensor on left-hand heat exchanger (change of resistance).

Reading obtained/slowly falling?

no

**Malfunction:**  
 Reading approx. 0 or approx. 15, not slowly falling.

**Trouble-shooting with multimeter:**  
 Switch off ignition. Disconnect control-unit plug from adapter lead.

Using ohmmeter, check the following leads for open circuit and short circuit.

- from control-unit plug socket 7 to plug of left-hand exchanger sensor
- from control-unit plug socket 11 to plug of left-hand exchanger sensor.

Reading approx. 0  $\Omega$

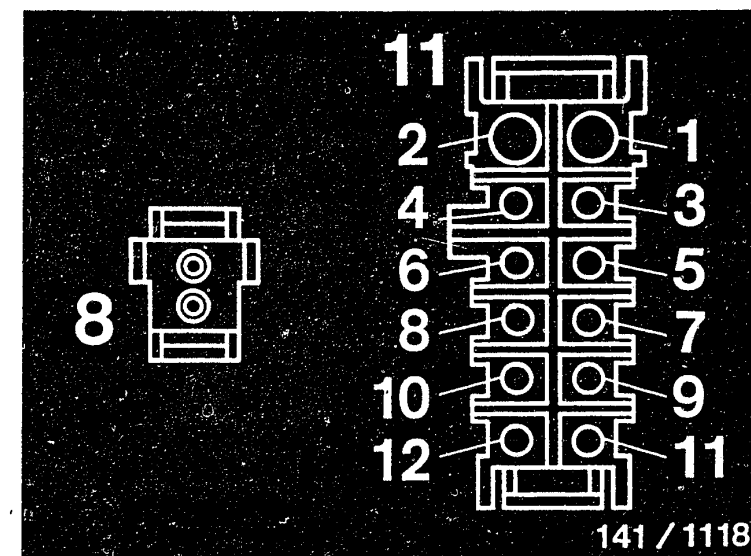
- Check on control-unit plug socket 7 to socket 11 (plug of left-hand exchanger sensor disconnected).

Reading  $\infty \Omega$

Check resistance of temperature sensor:  
 Connect ohmmeter directly between pins of temperature sensor.  
 Reading should be approx. 8...16 k $\Omega$  at approx. +15°...+30°C at temperature sensor.  
 Spray temperature sensor with refrigerant spray. Resistance must increase.  
 Note: If reading does not "fall slowly", the heating water in the heat exchanger may already have cooled down too much. If so, set rotary switch S1 on test adapter to position 7 for at least 15 sec. (Auxiliary switch S unlatched). Then continue with test step 4.

yes

Continued on B18/B19



8 = Plug of exchanger sensor  
 11 = Control-unit plug



### Test step 5

#### Operation

Rotary switch position (S1): 9

#### Measuring equipment:

Test adapter

#### Measuring range:

0 ... 15

#### Operation in vehicle:

Engine running

#### Additional operation:

Press auxiliary switch "S" on test adapter.

#### Reading on test adapter:

0 ... 3

By feeling, check that there is no heating effect on the right.

#### Testing of:

Operation of heating-water valve right-hand

Reading obtained/no heating effect on right?

#### Malfunction:

Heating effect present despite auxiliary switch "S" being pressed.

#### Trouble-shooting with multimeter:

Switch off ignition. Using ohmmeter, check lead from control-unit plug socket 6 to plug of duo heating-water valve socket 3.

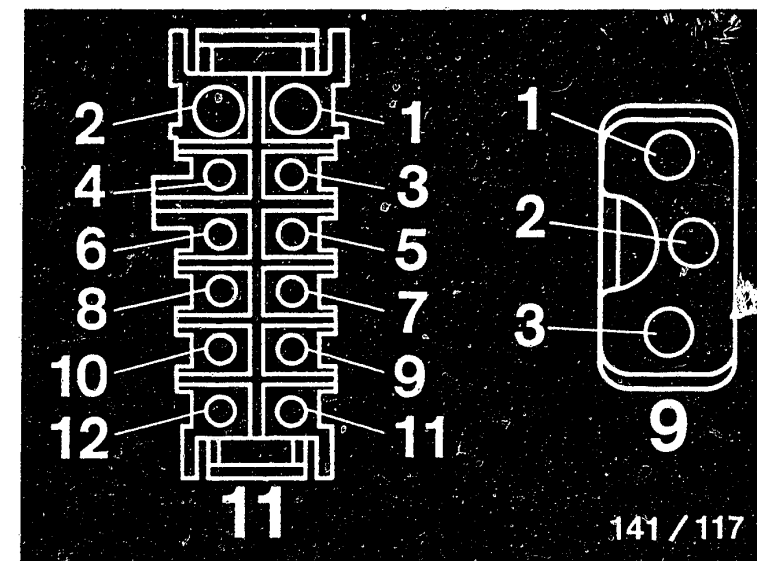
Reading approx. 0  $\Omega$

Using voltmeter, check at plug of duo heating-water valve socket 2 to ground.

Reading approx.  $V_B$

(ignition on).

If leads are O.K. and if battery voltage present and heating effect present despite auxiliary switch "S" being pressed, heating-water valve defective - replace.



9 = Plug of duo heating-water valve  
11 = Control-unit plug

no

yes

Continued on B20/B21

**B 18**

Trouble-shooting

Mercedes-Benz W 124



**B 19**

Trouble-shooting

Mercedes-Benz W 124



### Test step 5.1

#### Operation:

Rotary switch position  
(S1): 9

#### Measuring equipment:

Test adapter

#### Measuring range:

0 ... 15

#### Operation in vehicle:

Engine running

#### Additional operation:

Switch off auxiliary switch  
"S" on test adapter.

#### Reading on test adapter:

9 ... 14

By feeling, check that there  
is a heating effect on the  
right.

#### Testing of:

Operation of heating-water  
valve right-hand.

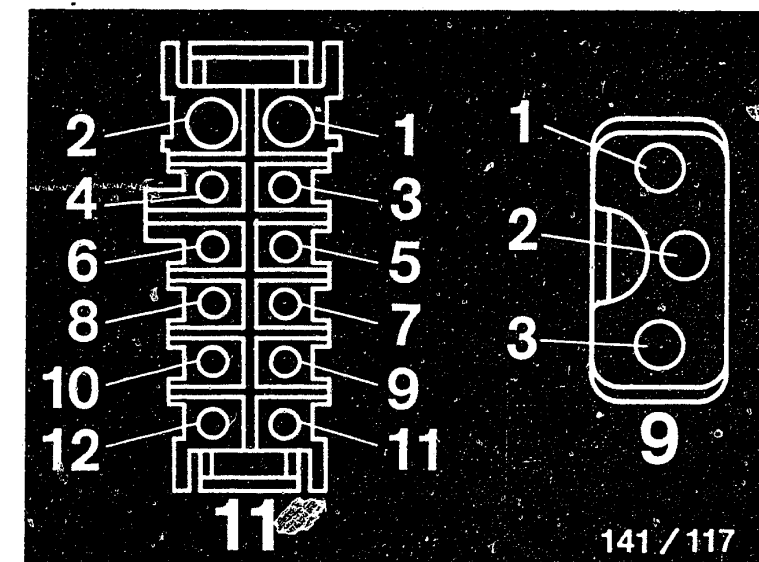
Test specification obtained/  
heating effect present?

no

#### Malfunction:

No heating effect despite reading 9 ... 14.  
Heating-water valve electrically O.K. but mecha-  
nically defective - replace.

Note: If system heats only at low engine speed,  
replace heating-water valve.



9 Plug of duo heating-water valve  
11 = Control-unit plug

yes

Continued on B22/B23

**B 20**

Trouble-shooting

Mercedes-Benz W 124



**B 21**

Trouble-shooting

Mercedes-Benz W 124





### Test step 6

(must come immediately after test step 5.1)

#### Operation:

Rotary switch position (S1): 10

#### Measuring equipment:

Test adapter

#### Measuring range:

0 ... 15

#### Operation in vehicle:

Engine running

#### Reading on test adapter:

7 ... 12

slowly falling

#### Testing of:

Temperature sensor on right-hand heat exchanger(change of resistance).

Reading obtained/slowly falling?

yes

Continued on C1/C2

### Malfunction:

Reading approx. 0 or approx. 15, not slowly falling.

#### Trouble-shooting with multimeter:

Switch off ignition. Disconnect control-unit plug from adapter lead.

Using ohmmeter, check the following leads for open circuit and short circuit.

- from control-unit plug socket 5 to plug of right-hand exchanger sensor
- from control-unit plug socket 11 to plug of right-hand exchanger sensor.

Reading approx. 0  $\Omega$

- Check on control-unit plug socket 5 to socket 11 (plug of right-hand exchanger sensor disconnected).

Reading  $\infty \Omega$

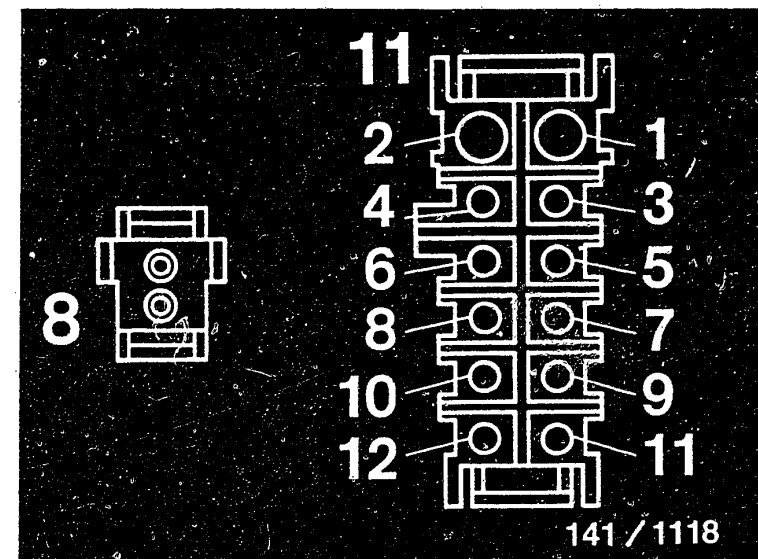
Check resistance of temperature sensor:  
Connect ohmmeter directly between pins of temperature sensor.

Reading should be approx. 8...16 k $\Omega$   
at approx. +15°...+30°C at

temperature sensor.

Spray temperature sensor with refrigerant spray.  
Resistance must increase.

Note: If reading does not "fall slowly", the heating water in the heat exchanger may already have cooled down too much. If so, set rotary switch S1 on test adapter to position 9 for at least 15 sec. (Auxiliary switch S unlatched). Then continue with test step. 6.



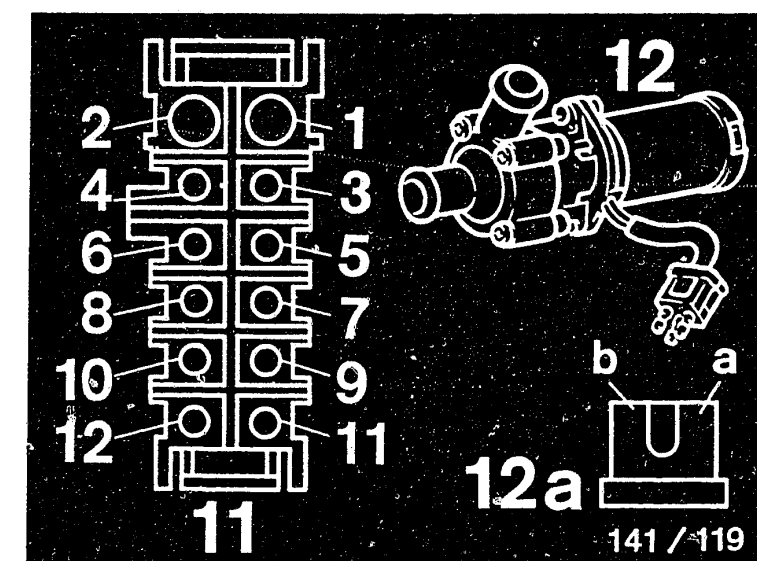
8 = Plug of exchanger sensor  
11 = Control-unit plug



Test step 7  
Operation  
Rotary switch position (S1): 11  
Measuring equipment:  
Test adapter  
Measuring range:  
0 ... 15  
Operation in vehicle:  
Switch off engine, switch on ignition, blower switch to position I  
Additional operation:  
Press auxiliary switch "S" on test adapter.  
Reading on test adapter  
0 ... 3  
By feeling/listening, check that heating-water pump is running.  
Testing of:  
Operation of heating-water pump  
Reading obtained/water pump not running?

no

Malfunction:  
Heating-water pump not running.  
Trouble-shooting with multimeter:  
Using ohmmeter, check on plug of heating-water pump socket a to ground:  
Reading approx.  $V_B$   
Using ohmmeter, check lead from control-unit plug socket 4 to plug of heating-water pump socket b for continuity.  
Reading approx.  $0 \Omega$   
Eliminate any open circuits and contact resistances at plug-in connections.



11 = Control-unit plug  
12 = Heating-water pump  
12a = Plug of heating-water pump

yes

Continued on C3/C4

**C1**

Trouble-shooting  
Mercedes-Benz W 124



**C2**

Trouble-shooting  
Mercedes-Benz W 124



### Test step 7.1

#### Operation

Rotary switch position  
(S1): 11

#### Measuring equipment:

Test adapter

#### Measuring range:

0 ... 15

#### Operation in vehicle:

Switch off engine, switch on  
ignition, blower switch to  
position I

#### Additional operation:

Press auxiliary switch "S" on  
test adapter again (unlatch).

#### Reading on test adapter:

9 ... 14

By feeling/listening, check  
that heating-water pump is not  
running.

#### Testing of:

Operation of heating-water  
pump

Test specification obtained/  
heating-water pump not running?

no

#### Malfunction:

Heating-water pump running.

#### Trouble-shooting with multimeter:

Switch off ignition, disconnect control-unit  
plug from adapter lead and plug from heating-  
water pump.

Using ohmmeter, check from control-unit plug  
socket 4 to ground.

Reading  $\infty \Omega$ .

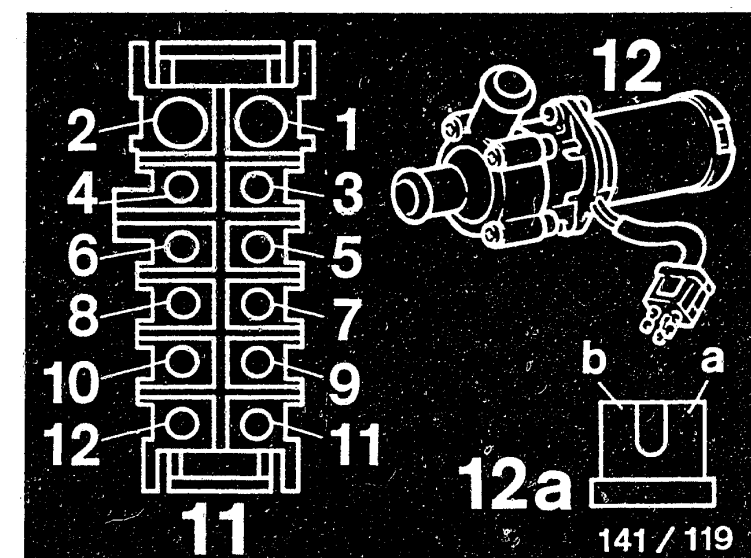
Using voltmeter, check on plug for heating-water  
pump socket a to ground:

Reading approx.  $V_B$

Using ohmmeter, check lead from control-unit plug  
socket 4 to plug of heating-water pump socket b.

Reading approx.  $0 \Omega$

Eliminate contact resistances, short circuits/  
open circuits on leads.



11 = Control-unit plug

12 = Heating-water pump

12a = Plug of heating-water pump



Testing with heating/air-conditioner test adapter is now completed.

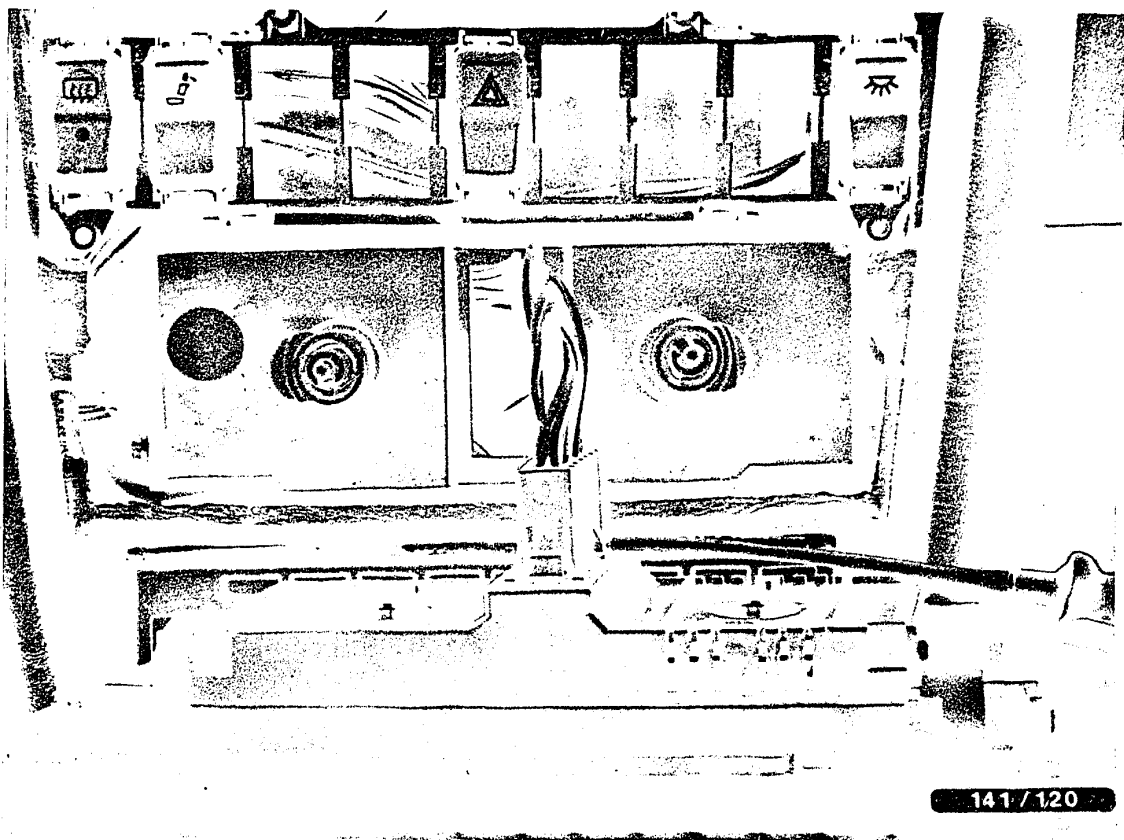
Set rotary switch (S1) on test adapter to "0".

Switch off ignition.

Disconnect adapter lead KDHK 0009 from control-unit plug.

Connect control-unit plug to control unit.





### Check left-hand temperature selector thumbwheel

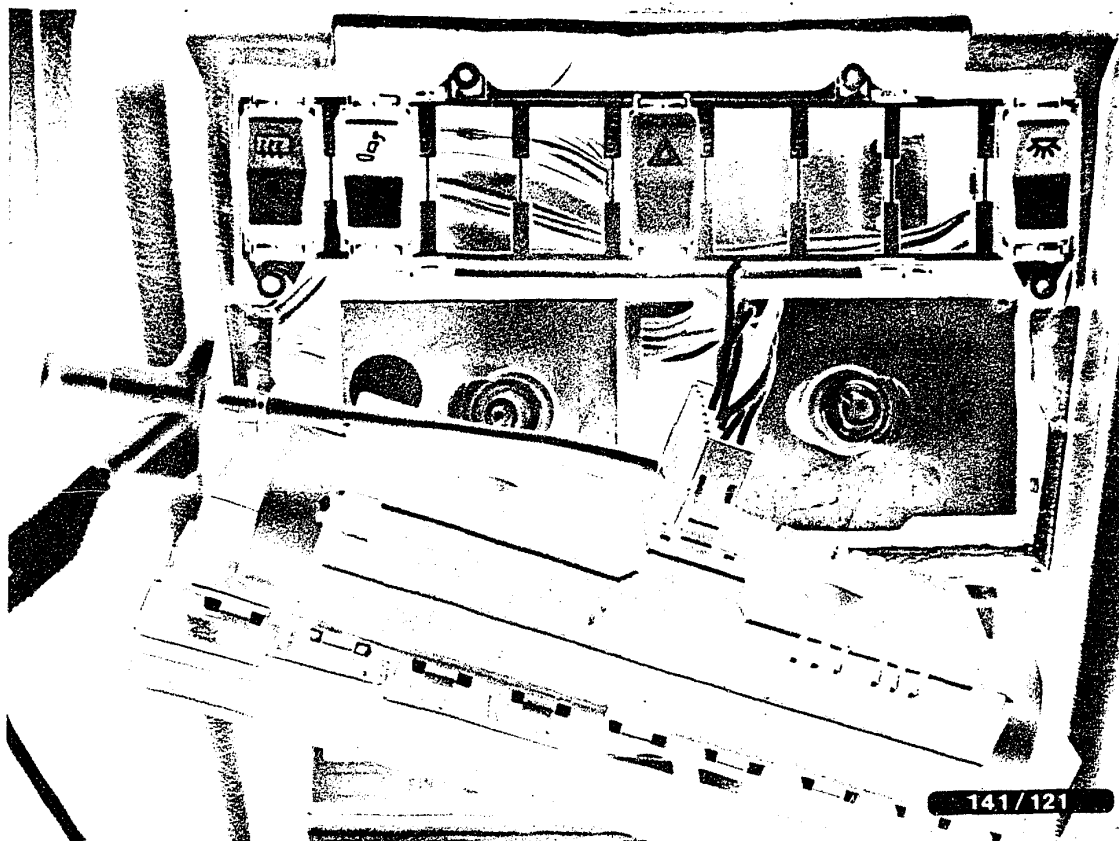
Using voltmeter, check directly at control unit term. 1 to term. 11 (ground) (control-unit plug connected to control unit). Ignition on.

Reading with temperature selector thumbwheel in position:

"Max" (latched):	6.9...8.1 V
before "Max" :	4.6...5.4 V
before "Min" :	2.3...2.7 V
"Min" (latched):	approx. 0 V

If test specifications not obtained, replace control unit.





### Check right-hand temperature selector thumbwheel

Using voltmeter, check directly at control unit term. 2 to term. 11 (ground) (control-unit plug connected to control unit). Ignition on.

Reading with temperature selector thumbwheel in position:

"Max" (latched):	6.9...8.1 V
before "Max" :	4.6...5.4 V
before "Min" :	2.3...2.7 V
"Min" (latched):	approx. 0 V

If test specifications not obtained, replace control unit.



If no fault has been found on the individual components when testing the automatic heating system but the system is still malfunctioning, try replacing the electronic control unit with control panel.

Connect control-unit plug to electronic control unit. Then check the system thoroughly once again in accordance with vehicle owner manual.



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